

10/526105
DT01 Rec'd PCT/ 25 FEB 2005

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-11 (canceled).

Claim 12 (new): A line converter comprising:

a three-dimensional waveguide arranged to propagate an electromagnetic wave in a three-dimensional space;
a dielectric substrate; and
a plane circuit having a conductor pattern disposed on said dielectric substrate;
wherein

the dielectric substrate is arranged to be substantially parallel to a plane E of the three-dimensional waveguide and at an approximately central portion of the three-dimensional waveguide and the conductor pattern of the dielectric substrate includes a conductor portion defining a shield area of the three-dimensional waveguide, a coupling-line portion that is electromagnetically coupled to a standing wave that occurs in the shield area, and a transmission-line portion extending from the coupling-line portion.

Claim 13 (new): The line converter according to Claim 12, wherein the conductor portion includes ground conductors disposed on two surfaces of the dielectric substrate.

Claim 14 (new): The line converter according to Claim 13, further comprising a plurality of conduction paths that penetrates the dielectric substrate and that is aligned on at least one of two sides of the transmission line, so as to be spaced away from the transmission line by as much as a predetermined distance, so that conduction is established between the ground conductors disposed on said two surfaces of the dielectric substrate.

Claim 15 (new): The line converter according to Claim 12, wherein a conductor of the three-dimensional waveguide is divided into two portions including an upper portion and a lower portion by a plane that is substantially parallel to the plane E and a space is provided in the conductor of the three-dimensional waveguide so as to create a choke defined by the space, where the space is provided at a position that is spaced away from the three-dimensional waveguide by as much as a predetermined distance, so as to be substantially parallel to an electromagnetic-wave propagation direction of the three-dimensional waveguide.

Claim 16 (new): The line converter according to Claim 12, wherein the transmission-line part includes a micro-strip line including the ground conductor disposed on one of the surfaces of the dielectric substrate and a line conductor disposed on the surface opposed thereto and on which the coupling-line portion is disposed to define a suspended line including the line conductor disposed on one of the surfaces of the dielectric substrate and the conductor of the three-dimensional waveguide.

Claim 17 (new): A high-frequency module comprising the line converter according to Claim 12 and a high-frequency circuit connected to each of the plane circuit and the three-dimensional waveguide of the line converter.

Claim 18 (new): A high-frequency module comprising the line converter according to Claim 15 and a high-frequency circuit connected to each of the plane circuit and the three-dimensional waveguide of the line converter.

Claim 19 (new): A high-frequency module comprising the line converter according to Claim 16 and a high-frequency circuit connected to each of the plane circuit and the three-dimensional waveguide of the line converter.

Claim 20 (new); A communication device comprising the high-frequency module according to Claim 17 provided in a unit for transmitting and receiving an electromagnetic wave.

Claim 21 (new): A communication device comprising the high-frequency module according to Claim 18 provided in a unit for transmitting and receiving an electromagnetic wave.

Claim 22 (new): A communication device comprising the high-frequency module according to Claim 19 provided in a unit for transmitting and receiving an electromagnetic wave.